UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105
SFD 8-3

July 24, 2006

Mr. Thomas Macchiarella, Code 06CA.TM
Department of the Navy
Base Realignment and Closure
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, CA 92108-4310

RE: Draft Soil Feasibility Study Report, IR Site 30, Alameda Point

Dear Mr. Macchiarella:

EPA has reviewed the above referenced document, prepared by Bechtel Environmental, Inc and submitted by the Navy on April 21, 2006. EPA requested a 30-day extension for review of the document, making comments due from the regulatory agencies on July 24, 2006.

The presentation of this Feasibility Study is predicated on an assumption that the inorganic contamination found in shallow soil at Site 30 is primarily a result of imported construction fill and therefore warrants limited remedial action. However, the Feasibility Study does not provide any compelling evidence that the contamination is due to non-site related activities. Further, it falls short in terms of demonstrating remaining (post time critical removal action) risk at the site to support remedial alternatives, does not adequately assess potential remaining exposure pathways and any necessary restrictions on those pathways, does not retain and present a satisfactory evaluation of remedial alternatives, and proposes remedial goals that are not health protective and are not consistent with remedial goals used at other IR sites at Alameda Point.

This Feasibility Study does not provide the basis upon which to select a remedy for Site 30 and therefore EPA does not accept it. We request a revised draft Soil Feasibility Study for Site 30 which addresses the comments enclosed with this letter and which provides an adequate basis for selecting an appropriate remedy for the site.

If you have any questions, please call me at (415) 972-3029.

Sincerely,

Anna-Marie Cook

Anna-Marie Cook
Remedial Project Manager

enclosure

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EPA Review of the Draft Soil Feasibility Study Report IR Site 30, Alameda Point

General Review:

The presentation of this Feasibility Study is predicated on an assumption that the inorganic contamination found in shallow soil at Site 30 is primarily a result of imported construction fill and therefore warrants limited remedial action. However, the Feasibility Study does not provide any compelling evidence that the contamination is due to non-site related activities. Further, it falls short in terms of demonstrating remaining (post time critical removal action) risk at the site to support remedial alternatives, does not adequately assess potential remaining exposure pathways and any necessary restrictions on those pathways, does not retain and present a satisfactory evaluation of remedial alternatives, and proposes remedial goals that are not health protective and are not consistent with remedial goals used at other IR sites at Alameda Point.

EPA believes the arguments and reasoning presented in the Site 30 Feasibility Study are flawed to the extent that the FS is completely inadequate. Our major disagreements with the findings in the FS are as follows: 1) Prior to the site being used for a school and day care center, it was used to store scrap and aircraft parts. Aircraft parts typically are made from alloys containing the metals found contaminating the Site 30 soil. The expected pattern of contamination resulting from such stored materials impacting soil would be shallow, sporadic contamination of inorganics. Such a pattern is found in soil at Site 30. EPA therefore believes that it is likely that former Navy activities <u>are</u> responsible for low level inorganic contamination of shallow soil at this site. 2) EPA has reviewed the LBNL study used as a reference and basis for the Navy's determination of a remedial goal for arsenic in this Feasibility Study, and as a basis for taking no action for any other contaminant. We find no similarities in the situations or the data provided for comparison between the two sites, or any compelling evidence or reason to believe that the study has any relevance to Site 30. Further, the results of the LBNL study appear to have been selectively applied to Site 30 so that an unusually high concentration level can be used for the arsenic remedial goal. We cannot accept this study as a background comparison for Site 30. 3) Post removal action risk for Site 30 is lower than the the risk presented in the RI report. The recalculated risk and the areas it affects should be included in this FS to provide the basis for taking no further action for contaminants such as PCBs, PAHs and lead. 4) EPA's policy on clean up to background levels has been misstated and misused in this document. We do not support the position of leaving an island of contamination in a surrounding sea of clean on an NPL site.

As stated in EPA comments on the Draft Soil Remedial Investigation Report for IR Site 30, the RAO should be based on the 95th upper confidence limit (UCL) of the Alameda Point "pink" background data set. Please revise the FS accordingly and eliminate references and comparisons to the LBNL study.

General Categories of Problems with the Report

I. Comparison of LBNL Study to Alameda Point

1. Background means ambient levels in the area. Even if it were accepted that the background data for the rest of Alameda would not be appropriate "background" for this site, then the next step would be to sample areas around Site 30 to investigate background there – e.g., at site 25, the College of Alameda and the Alameda Annex. However, this document does not discuss background levels at any of the nearby Alameda sites.

2. Even assuming that arsenic concentrations from the Great Valley group were "natural" in their place of origin, those concentrations, when the soil is brought to another area, do not automatically become "background" levels. One of the reasons given by EPA for generally not cleaning up below background levels is to avoid creating "clean islands" amid widespread contamination, because cleaning up below background may not make sense when there's the potential for recontamination of remediated areas by surrounding areas with elevated background concentrations. (See citations under comment below regarding page 3-5.) Here, it is doubtful that surrounding areas have the "background" numbers discussed in the FS.

3. Even if we knew that this soil came as fill from the Oakland Hills we do not know that in its place of origin, the arsenic was "natural".

4. **Section 2.8, Post-RI Analyses of Metals Concentrations in Soil, Page 2-17 and Section 2.8.1, Statistical Analysis of IR Site 30 Data, Pages 2-17 and 2-18:** The text states that arsenic, aluminum, iron, and manganese were selected for statistical analysis, but according to Table 2.4, only arsenic data is available from the Great Valley Group for comparison with possible fill soil sources. A comparison cannot be based on only one metal.

   In addition, the fact that 5 arsenic "outliers" had to be removed when at most one outlier for the other metals was removed suggests the potential for arsenic contamination. The Shapiro-Wilk Normality Test does not identify outliers as stated in the text, it is a test for normality. Further, the referenced DTSC guidance (1997) states that high values that are removed as outliers should be evaluated as potential hot spots. This was not done.

5. **Section 2.8.4.1, Composition of Site 30 Soil, Page 2-20:** The text states that the "higher concentration of arsenic and other common metals observed in IR Site 30 soil is most likely a function of the higher metals content of the clay size fraction representative of the source material," but this is conjecture and it is not clear that the arsenic does not have an anthropogenic source. This area was formerly used for military housing and for storage and, in addition to being present in aircraft components, arsenic may have come from use

as a pesticide/rodenticide during those time periods or originated from runoff from arsenic-treated wood or from paint storage, paint use, or sandblasting.

6. **Section 2.8.4.1, Composition of Site 30 Soil, Page 2-20:** The text states that the fill soil at Site 30 is different in color, texture, and mineralogy from other Alameda Point soils, but data was not provided to support this statement. In addition, lithologic descriptions tend to vary, depending on the geologist who records the lithology and whether or not standardized materials like a rock or soil color chart were used. Please provide data that compares the Site 30 soil with lithologic information from the rest of Alameda Point. This comparison should include a discussion of whether color charts were used by each geologist who logged a set of boreholes and specify the number of borehole logs from the rest of Alameda Point that were used for the comparison, compared to the total number of boreholes at Alameda Point.

   In addition, data was not provided to support the discussion of mineralogy in the fourth paragraph. Please provide details about this analysis, including the procedures used. Further, it appears that the comparison should be made between clayey soils, not between clay and sand. This comparison should be made using data from fill soils, not the Bay Mud. Please revise this paragraph to compare clayey soils from Site 30 with clayey soils present in fill from other areas of Alameda Point.

7. **Section 2.8.4.2, Correlation of IR Site 30 Soil With Off-Site Sources, Page 2-21:** The FS Report argues that metals data from the combined Oakland Hills data set support the hypothesis that other sources of fill soil in the Bay Area could have been used as fill material at IR Site 30; however, it appears, from the data presented in Table 2-4, that the median values of the combined Oakland hills data set are about as different from the IR Site 30 values as are the Alameda Point background median values. The only similarities appear to be elevated arsenic concentrations and similar chromium, cobalt and copper concentrations. In addition, no metals data are presented for the Great Valley Group, from which the background arsenic concentration was taken. The Great Valley Group was selected based on soil type and appearance, but metals concentrations in the Great Valley Group are not discussed or compared with IR Site 30 metals concentrations. There appears to be no justification for selecting the Great Valley Group arsenic concentration as the background concentration for IR Site 30.

   Furthermore, it is not clear why the 99th percentile (42 mg/kg) was selected rather than the 95th percentile (28 mg/kg). Without adequate justification for selecting a specific soil source such as the Great Valley Group for background arsenic value (i.e., by collecting a statistically significant number of samples from both locales and doing metals analyses, grain size analyses, and petrographic analyses), it appears that a more conservative background value should be selected as has been done for the other IR sites at Alameda Point, for example the 95th UCL.

8. **Section 2.8.5, Summary and Conclusions for Background Evaluation, Page 2-22:** The third bullet on this page states that concentrations of arsenic, barium, chromium, cobalt, copper, nickel, vanadium, and zinc at IR Site 30 are more similar to the Great Valley Group in the Oakland Hills than to the Alameda Point background values. This statement is misleading; first because the data presented to support this conclusion is from the combined Oakland Hills data set and not the Great Valley Group alone, second because concentrations of barium, chromium, nickel, vanadium, and zinc, do not appear to be similar to the Oakland Hills data set. According to the data presented in Table 2-4, IR Site 30 soil in no way appears similar enough to the Oakland Hills data set to be a 'match'. Some of the metals values are significantly higher and some are significantly lower.

II. Conceptual Site Model

9. As stated in the section above, "background" means ambient levels in the area. Even if it were accepted that the background data for the rest of Alameda would not be appropriate "background" for this site, then the next step would be to sample areas around Site 30 to investigate background there – e.g., at site 25, the Alameda Annex or the College of Alameda. However, this document does not discuss background levels at any of the nearby Alameda sites.

10. **Section 2.4, Nature and Extent of Soil Contamination, Page 2-12:** The FS Report states that polynuclear aromatic hydrocarbons (PAHs) were reported at concentrations exceeding the residential soil PRGs at various location at IR Site 30, but PAHs were not identified in the RI Report as a chemical of concern (COC) to be carried through to the FS. Revise the FS Report to discuss why PAHs were not identified as a COC.

11. **Section 2.4, Nature and Extent of Soil Contamination, Page 2-13:** Although the text states that "Site data indicate that the arsenic concentrations at IR Site 30 are naturally occurring" and that the distribution of arsenic is apparently random," it appears that there are patterns in the distribution of arsenic at IR Site 30. For example, most of the surface soil in the vicinity of the school has arsenic concentrations above 30 milligrams per kilogram (mg/kg). Similarly, there are three locations along the northern and eastern site boundaries with arsenic in surface soil above 30 mg/kg and there are a few other areas with arsenic concentrations between 10 and 30 mg/kg. Since arsenic commonly was used as a pesticide and rodenticide, as an antifouling additive to paints and as a component in aircraft engines and this area was formerly military housing and then Defense Reutilization and Marketing Office (DRMO) storage, it cannot be concluded that arsenic is "naturally occurring." Further, the presence of hot spots suggests that releases may have occurred. Please rewrite this section to discuss the former uses of this site, the uses of arsenic, and the fact that there are hot spots

12. **Section 2.5 Fate and Transport of Contaminants, Page 2-13:** Arsenic was identified as the COC for the FS Report; however, it is not clear why manganese and vanadium, which are common metals found in metal alloys that make up aircraft parts, were not included since these metals exceeded the residential soil PRG, and were not discussed as being removed in the TCRA. Please include manganese and vanadium as COCs.

13. **Section 2.6.1, Human-Health Risk Assessment, Page 2-15:** Although the text states that "site data indicate that the arsenic concentrations are naturally occurring," patterns indicative of hot spots can be observed on Figures 2-12 and 2-13. These hot spots may be indicative of releases from stored materials rather than contaminated soil fill, since most of the concentrations above the range of (pink data set) background concentrations were in surface or shallow soil. Please delete the quoted statement.

14. **Section 2.8.2, History of IR Site 30, Pages 2-18 and 2-19 and Section 2.8.3, Applicability of Alameda Point Background Data, Page 2-19:** Although the text states that there are no known activities "that would have resulted in increased concentrations of 16 metals from the surface to 5 feet bgs," this does not take into account the use of this area for storage. It is probable that releases have occurred during storage. Of the 16 metals, it is likely that arsenic, chromium, copper, lead, mercury, vanadium and zinc were used at Alameda Point as part of metal alloys used in aircraft components. Please revise the text to state that these metals could be site contaminants and delete statements that the Alameda Point pink background data set does not apply.

15. **Section 2.8.5, Summary and Conclusions for Background Evaluation, Page 2-22:** The text of the second bullet implies that since aluminum, iron, and manganese are normally distributed, they are naturally occurring, but since these metals are in aircraft components, they should not be used to support any conclusions about whether arsenic is naturally occurring. In addition, although the text states that arsenic was also normally distributed, five "outliers" had to be removed to achieve a normal distribution, further bringing into question that the arsenic is naturally occurring.

16. **Section 2.8.5, Summary and Conclusions for Background Evaluation, Page 2-22:** It is not clear that all of the background samples were collected from dredged materials or from sands as stated in the fourth and fifth bullets. Please provide support for these statements.

17. **Page A3-9, CZMA.** The Navy should identify where the coastal zone is defined as 100 feet.

III. Presentation of Risk

18. **Page ES-8,** Alt. 1 states that incremental health risk associated with arsenic is

insignificant, but no numbers are given. At the FS stage, numbers help to support the decision about whether to take action and what type of action is warranted.

19. **Section 2.1.2, Current and Past Operations, Page 2-2:** The bottom of this page discusses a time-critical removal action conducted in November 2004, but the contaminants addressed by this removal action are not described. It would be helpful to know the concentrations prior to the removal, and what cleanup goal was used. Please revise the FS Report to clarify the nature of the contamination addressed by the removal action.

20. **Section 2.4, Nature and Extent of Soil Contamination, Page 2-13:** The FS Report summarizes the time-critical removal action (TCRA) that was conducted in 2004, but it is not clear what contaminants the TCRA addressed. Also, it appears that contamination was left in place since the area was subsequently covered with a geotextile liner. Please revise the FS Report to clarify the nature and extent of contamination addressed in the TCRA and the risk represented by the contamination that remains.

21. **Section 2.6.1, Human-Health Risk Assessment, Page 2-15 and Section 2.7, Remedial Investigation Summary and Conclusions, Page 2-16:** The text states that the human health risk assessment (HHRA) "conservatively assumed that the entire site is unpaved" and discussed the use of this site as a school and child development center where most of the surface is paved or covered with buildings, but according to Section 2.1.4, a possible future use of Site IR-30 is "medium-density residential." If this site is redeveloped, construction workers and future residents could be exposed to soil unless soil hot spots are excavated or there are engineering controls to limit potential exposure. Therefore, it appears that the HHRA was not too conservative. Please acknowledge the potential that this site could be redeveloped into medium-density residential housing and factor this possibility into the evaluation of the remedial alternatives.

22. **Section 3.1 Affected Media and Chemicals of Potential Concern, Page 3-1:** The FS Report lists VOCs, PAHs, other semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs) and other metals as having been determined to not warrant further action; however, the basis for this determination is not clear. In addition, a removal action for PCBs has already occurred. For clarity and completeness, please revise the FS Report to discuss why these chemicals do not warrant further action.

23. It would be preferable to include the residential risk numbers in the text as well as in Table 3-1, since whether or not property is suitable for unrestricted use needs to be analyzed.

24. Hazard index: The text is too vague, stating just that the HI is "exceeded 1" (e.g. p. 3-1), but it appears from Table 2-3 that the current HI is 4 or 5.

25. **Table 3-1** states that risks to a child are within the risk range, but does not discuss the HI numbers. This should be included.

26. **Previous removal (p. 6-1).** These sections discuss a previous removal, but do not include details. It would be helpful to know what were the concentrations prior to the removal, and what cleanup goal was used.

27. **Page 7-2, Sec. 7.1, and page 6-7 and 6-8, Sec. 6.2.2.1.** These pages include statements that risks would be within the risk management range or lower if data were calculated differently, but no numbers are given. If the Navy considers the risk numbers used in the FS for current conditions to be inaccurate, revised number should be included that they consider to be accurate.

28. **Section 7.1, Overall Protection of Human Health and the Environment, Page 7-2:** The text states that "risks for all exposure scenarios, including a hypothetical future resident, would be within the risk management range or lower if the Great Valley Group arsenic background data set concentrations ...were used," but this statement is misleading. The site risks would not change by using a different background concentration, rather, more of the site risk would be attributed to background and therefore not require remediation. The total risk would remain the same. Please revise the FS Report to clarify that using different background concentrations does not change total risk.

IV. Misleading and Incorrect Statements

29. Stating that there are guidances that prohibit cleaning up contamination that is at background levels appears to be an overstatement. While EPA agrees that Superfund remedies generally do not clean up below background, "EPA does not agree that cleanup should always be to background levels. In some cases, background levels are not necessarily protective of human health, such as in urban or industrial areas; in other cases, cleaning up to background levels may not be necessary to achieve protection of human health because the background level for a particular contaminant may be close to zero, as in pristine areas." (NCP preamble, 55 Fed. Reg. p. 8717-8, March 8, 1990.) EPA's 2002 memorandum, "Role of Background in the CERCLA Cleanup program," OSWER 9285.6-07P (May 1, 2002), p. 5, discusses factors to be considered in deciding whether to clean up below background, e.g. cost effectiveness, technical practicability, and the potential for recontamination of remediated areas by surrounding areas with elevated background concentrations. It does not appear that these factors have been considered in the selection of 42 ppm as the cleanup level for arsenic. Similar factors are discussed in EPA's "Rules of Thumb for Superfund Remedy Selection," EPA 540-R-97-013, OSWER 9355.5-0-69 (August 1997), p. 8, discussing the possibility of cleanup up below background, especially anthropogenic background levels.

30. **Section 2.6.1, Human-Health Risk Assessment, Page 2-15:** This page includes the statement that "some scientists believe that the toxicity of arsenic may be overestimated and are urging U.S. EPA to reconsider the toxicity assessment for arsenic and set a less stringent toxicity factor". This statement appears to be irrelevant to the discussion of the risk assessment; please delete it from the FS Report in this section and in Section 6.2.2.1.

31. **Section 2.6.1, Human-Health Risk Assessment, Page 2-15:** The FS Report states that if a site-appropriate arsenic background concentration were used for comparison, site risks for all exposure scenarios would be considerably lower, but this statement is misleading. The site risks would not change by using a different background concentration, rather, more of the site risk would be attributed to background and therefore not require remediation. The risk would remain the same. Please revise the FS Report to clarify that using different background concentrations does not change risk.

32. **Section 3.4.3, Technical Factors, Page 3-5:** The arsenic cleanup value accepted by DTSC for the Village at Green Hill in Placer County is not relevant for Alameda Point. Please delete this discussion.

33. The discussion on **page 3-5, Sec. 3.4.3**, of other situations where the arsenic concentrations similar to those at Site 30 have been found to be acceptable is not very compelling. Please delete these comparisons.

34. **Section 3.4.4, Remedial Action Objective for Arsenic, Page 3-5:** It is not acceptable to develop a remedial action objective (RAO) for arsenic based on the 99th percentile of the Great Valley Group background data set. As stated in EPA comments on the Draft Soil Remedial Investigation Report for IR Site 30, the RAO should be based on the 95th upper confidence limit (UCL) of the Alameda Point pink background data set. Please base the RAO for Site 30 on the 95th UCL of the Alameda Point pink background data set and revise the FS accordingly. In addition, please delete all statements about concentrations of arsenic being naturally occurring (e.g., Section 4.3.1.1).

35. **Soil cover. Page 4-8** of the FS indicates that the single-layer cover is retained, and **Table 4-3** indicates capping is retained for use as a component of remedial alternatives. This is confusing, because none of the remedial alternatives that were actually developed include a cover/cap component. This should be explained.

36. **Page 6-2** states that the remedial alternatives "do not have to meet all five balancing criteria." This mischaracterizes the balancing criteria. An alternative does not "meet" the balancing criteria; rather, these are all criteria to be used in analyzing the advantages and disadvantages of each alternative.

37. **Section 6.2.2.1, Overall Protection of Human Health and the Environment, Pages 6-6 and 6-7:** It appears that the text of Section 2.8.5 was repeated in this section, but the

arguments made in that section have not been substantiated with data. Please delete the text that has been copied form Section 2.8.5 from this section.

In addition, although the text states that "IR Site 30 data and statistical analyses indicate that metals concentrations in shallow fill soil at IR Site 30 are not associated with Navy activities," but as discussed in earlier comments, Navy activities that could have resulted in soil contamination likely occurred in this area. Please delete the quoted statement.

As stated earlier, a background value from the Great Valley Group cannot be used for Alameda Point. Please delete all references to the Great Valley Group from the text and use Alameda Point background data to evaluate IR Site 30 data, then re-evaluate whether Alternative 1 (no action) is protective of human health and the environment.

38. **P. A1-4, RAO:** The RAO to prevent human exposure to soil posing unacceptable risk "until the agencies concur that there is no longer an unacceptable risk" should be modified to just say "prevent human exposure to soil posing unacceptable risk." The second part of the sentence implies that the agencies will change their minds as to what is unacceptable risk. If that occurs, then the ROD will need to be amended.

V. Evaluation of the Remedial Alternatives

39. **Executive Summary, Alternative 4 - Phytoremediation, Page ES-8 and Section 5.1.4, Alternative 4, Phytoremediation, Page 5-3 and 5-4:** The location proposed for conducting phytoremediation under Alternative 4 - the elementary school playground - does not appear to be an appropriate location for spreading contaminated soil. Please revise the FS Report to clarify how the elementary school playground was determined to be an appropriate location for this alternative and why other locations could not be used.

40. **Soil beneath the buildings:** There's essentially no discussion of the soil under the buildings, although the discussion of the ICs on page 6-10 indicates that Alternative 2 includes a restriction on removal of buildings. However, Alternative 3 does not address soil under buildings.

41. **Section 4.3.2 Institutional Controls, Page 4-4:** This section discusses how institutional controls would be implemented, but it does not describe the activities that would be restricted. Please revise this section to describe the types of activities that institutional controls would restrict and how this would be protective.

42. The explanation for ruling out Alternative 4 is not adequate, especially given the statement that it would be less costly than Alternative 3 (see page 4-12). Page ES-9 says this alternative was eliminated because the 5-year duration and pilot-scale testing were judged less implementable and less compatible with existing site uses than other

alternatives. This is not overly convincing. In terms of implementability, ICs last indefinitely, and here they are complicated because they will require actual work – pavement maintenance – each year. On the other hand, total excavation and off-site disposal is quite costly. Given these concerns, Alternative 4 deserves a second look.

43. **Section 5.1 Development of Potential Remedial Alternatives, Page 5-1:** In-situ phytoremediation was retained as a process option, but was not included in the development of remedial alternatives. Please revise the FS Report to include in-situ phytoremediation in a remedial alternative.

44. **Section 5.1.3 Alternative 3 - Excavation to 4 feet bgs, Page 5-13:** No confirmation sampling is included in this alternative because arsenic in soil is apparently randomly distributed; however, this does not appear to be adequate justification for not collecting confirmation samples. A random distribution of contaminant concentrations can be evaluated and compared with a cleanup goal using statistical methods. Please revise the FS Report to include some method, such as confirmation sampling with statistical analysis, to demonstrate that the remedy has achieved the RAO. In addition, please revise the cleanup goal for arsenic to the 95th UCL of the Alameda Point pink background data set.

45. **Section 5.1.4, Alternative 4, Phytoremediation, Page 5-3 and 5-4:** The text states that it was assumed that the eastern half of the site could be used for ex-situ phytoremediation for a five year period, but the site is currently in use as a school; according to Section 2.1.4, when the elementary school closes, a high school will be opened. It appears that the eastern half of the site will not be available for use; Table 5-2 also indicates that phytoremediation is not compatible with current land use. Please provide justification for the assumption that the eastern half of the site will be available for ex-situ phytoremediation or include another location for phytoremediation.

46. **Section 6.3.1.1, Pavement Maintenance, Page 6-9:** It seems that applying a tack coat every 10 years and repairing cracks every 15 years will be insufficient to maintain an asphalt surface. Please provide data for asphalt parking lots, where the asphalt is of a similar thickness to that used at IR Site 30 to support the frequency of maintenance or revise the proposed maintenance schedule to reflect the likely needs to maintain the asphalt cover as a parking lot.

47. The protectiveness of the no action alternative depends on the presence of pavement and building to prevent exposure above cleanup goals; however, under this alternative there is nothing to prevent pavement or building from being removed. For this reason, it appears that No Action would not be protective. Please revise the FS Report to change the evaluation of the No Action alternative accordingly or clarify how it would be protective given the possibility that pavement could be removed.

48. **Section 6.4.2.4, Reduction of Toxicity, Mobility, or Volume Through Treatment, Pages 6-14 and 6-17, and Section 7.4, Reduction of Toxicity, Mobility, or Volume Through Treatment, Page 7-2:** The mass of arsenic would not be reduced by relocating it to an off-site facility, and treatment is not involved in Alternative 3, so it is not correct to state that "the mass of soil containing arsenic ... would be significantly reduced. Similarly, since no treatment is involved in the excavation and off-site disposal alternative, this alternative should not be rated high. Please revise the text to state that toxicity, mobility, and volume would not be reduced through treatment for Alternative 3 and revise the rating of this alternative.

49. **ICs:**
(a) Pavement maintenance as a remedy: This remedy essentially requires action – not just monitoring – indefinitely. How do we determine when the remedy has been completed?
(b) Given the residential risk, "no residential use" should also be an IC.
(c) There are statements throughout the document that the duration of ICs will be 30 years (e.g. p. 5-3, 6-10, 6-11). What is the basis for that statement? Why not assume the ICs will be in place in perpetuity? (This is not the issue of using 30 years to calculate the costs of ICs.)
(d) Both pages 5-2 and 6-11 indicate that ICs will be in place until the Navy and regulators "concur that there is no longer a need to prevent such exposure." This is confusing and does not appear appropriate for a remedy that does not include any action to lower the concentrations of the COCs. It also appears that ICs could be lifted without a ROD amendment. Please clarify how the ICs could be lifted.
(e) Page 5-3 indicates that the ICs will not include fencing or signage. Given that this is a school property, at a minimum it seems that signage should be required.

50. **Comparative analysis of alternatives.** EPA continues to object to giving a total "ranking" of the alternatives in an FS, as is done here on p. ES-10 and in Section 7.10. Rather, the comparative analysis should consist of a narrative discussion of the alternatives under each criterion. See, e.g., the sample comparative analysis in Appendix F of EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*, EPA/540/G-89/004, OSWER Dir. 9355.3-01 (August 1988). See also the comparative analysis performed by the Navy at Alameda Site 14, which we consider a better approach than the one used in this FS. According to the EPA guidance, the purpose of the comparative analysis "is to identify the advantages and disadvantages of each alternative relative to one another so that the key tradeoffs the decisionmaker must balance can be identified." In a section entitled "Presentation of Comparative Analysis," the guidance states: "The comparative analysis should include a narrative discussion describing the strengths and weaknesses of the alternatives relative to one another with respect to each criterion ...." (EPA 1988 p. 6-14, Sec. 6.2.5 and 6.2.6.)

Conclusory statements as to which alternative rates highest in the balancing criteria do not add value to the narrative analysis, and are objectionable in that they suggest pre-

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selection of a remedy, leading readers to conclude that the remedy has already been selected. If a different remedy is eventually selected, the Navy will have to explain why it was selected over the "higher-ranked" alternatives. In addition, summary ratings can give false precision, as any rating of criteria is inherently subjective, and the criteria do not necessarily lend themselves well to quantification. For example, the subfactors within a criterion can cut different ways, an example being short-term effectiveness, where more active remedies almost always involve more impacts on workers and the community in the short term than MNA, yet they also reach remedial goals sooner – so it is not easy to give an overall rating to an alternative as to this criterion. Given these considerations, EPA strongly recommends that in future documents and in future iterations of this document, the Navy refrain from conclusory summary ratings of the criteria, and instead follow the model used at Sites 14 and 17 and in the EPA 1988 guidance.

51. **Table 3-1** says risks to child are within the risk range, but does not discuss the HI numbers. This should be included.

52. **Page A3-9, CZMA.** The Navy should identify where the coastal zone is defined as 100 feet.